CEMC Roundtable II:
Defining NOS Nutrient Enrichment and Eutrophication Monitoring Needs
June 22, 2000
Meeting Summary

Background

The NOS Coastal Environmental Monitoring Committee (CEMC) held a roundtable discussion on Thursday, June 22 entitled *"Defining NOS Nutrient Enrichment and Eutrophication Monitoring Needs"* (see Attachment 1 for participant list). This meeting was a follow up to Roundtable I: *Improving the Effectiveness of Existing NOS Environmental Monitoring Programs* held April 7, 2000, at which the inventory of existing monitoring activities was examined to evaluate opportunities for further improving the effectiveness and efficiency of NOS monitoring activities. A summary of results from the first roundtable and *Report 1: Current and Planned NOS Environmental Monitoring Activities* are available online at http://is2.nos.noaa.gov/monitoring/cemc/ under Materials for CEMC Report.

Roundtable II was the second of a set of focused work sessions being conducted by the CEMC, designed to result in a plan that presents a more integrated approach to NOS environmental monitoring. After the first Roundtable, it was agreed that focusing on a particular issue (i.e., nutrients) would help in developing specific recommendations for improved NOS monitoring. Nutrient enrichment was chosen as a focal point because of the crosscutting nature of this problem, the importance of nutrient impacts for the coast[1], and the relevance of this issue to the work of the NOS Nutrient Synergy Team.

Roundtable II Objectives

The objectives of the Roundtable II were to:

1. Stimulate discussion about NOS' role in nutrient monitoring
2. Generate ideas about the 5-year vision for NOS' nutrient monitoring activities, and
3. Identify any clear priorities for investment, based on need and NOS' unique capabilities and responsibilities.

The CEMC Roundtable II resulted in development of a list of ideas to be incorporated into an NOS nutrient monitoring program, with the following identified as priorities:

- Conduct a National Estuarine Eutrophication Assessment follow up;

[1] See NOAA's *National Estuarine Eutrophication Assessment: Effects of Nutrient Enrichment in the Nation's Estuaries* and the National Research Council report *Clean Coastal Waters: Understanding and Reducing the Effects of Nutrient Pollution*

- Use the National Estuarine Eutrophication Assessment as a performance measure but modify the design to include remote sensing and more intensive data collection;
- Optimize existing monitoring platforms within NOS and integrate data from other state and Federal agencies;
- Develop standards for monitoring eutrophication among agencies so that data is consistent and can be compared and used collectively.

These results will be incorporated into CEMC Report II, which will present the recommendations for improving the effectiveness and efficiency of NOS monitoring programs, along with general estimates of the resources necessary to achieve an integrated monitoring program.

Setting the Context

Roundtable II began with presentations of background materials, including a review of the CEMC history and a timeline for development of the Final Recommendations and Monitoring Plan to prepare participants for their charge (see Attachment 1). A series of map overlays were used to show the widespread nature of nutrient enrichment impacts in the nation's coastal waters. A second set of overlays presented the geographic extent of NOS' nutrient monitoring activities. A final set of map layers illustrated the landscape of current and proposed nutrient monitoring activities conducted by other agencies and how these overlap with NOS programs. This "nutrient monitoring landscape," in conjunction with the NOS five-year vision and NOS roles and responsibilities provided the context for discussion of NOS priorities for a nutrient monitoring program:

- Should NOS focus on where assessments have already identified problems or where there is no data?
- What should NOS' monitoring activities be compared with EPA, USGS, and other federal and state monitoring programs?
- Should NOS proceed alone or participate in interagency monitoring activities?

The suggestion was made that NOS activities and interagency activities are interconnected and overlapping and should be pursued jointly with other agencies.

Plenary Results: Clarifying NOS' Vision, Roles and Responsibilities

In response to the presentations, participants were asked to consider the roles and responsibilities of NOS with regard to nutrient monitoring, either adding to or deleting from a prepared list (see attachment 2). Discussion about NOS Roles and Responsibilities focused on what the difference is between NOS roles, responsibilities, and goals with regard to nutrient monitoring. Participants struggled with the list and how to follow through with the workshop objectives because some of what were

identified as roles and responsibilities were considered to be NOS goals (i.e. National Picture), while others were considered to be products of monitoring and research (i.e. Forecasting), others were considered to be place based activities (i.e. Marine Protected Areas), and some were considered to be follow-up to monitoring activities (i.e. Special Ecosystem Studies). In addition, there were some that could be considered an NOS role but not necessarily a responsibility. Finally, in considering the focus of the CEMC on monitoring, some of the identified Roles and Responsibilities were considered research oriented and didn't necessarily belong on the list (i.e. Process Research).

It was agreed to simplify the original list of roles and responsibilities into three "tiers." These matched the proposed monitoring framework outlined in the CENR's report *A National Coastal Monitoring Program*, and were adopted but slightly modified by the CEMC:

- Tier I – National Picture described by National Status and Trends type monitoring and assessment
- Tier II – Site Specific studies are supported by monitoring and process research, and include: NERRS
  Marine Protected Areas
  Track results (performance measurement)
  Special ecosystem studies.
- Tier III – Research and Technology to support Monitoring and to better understand monitoring results including:
  Development and application of state-of-the-art technologies
  Process research
  Method development and improvement.

National Picture Example

To help illustrate the desired product from the roundtable discussions, Paul Orlando presented an example for NOS' responsibility to describe a "National Picture" of nutrient enrichment conditions (attachment 3 entitled National Picture). The objective was to offer a stepwise process for developing a 5-year vision of nutrient monitoring and assessment activities that support the national picture. In addition, the process was meant to demonstrate how an understanding of the existing landscape of nutrient monitoring activities in other Federal and state agencies could help NOS define its unique role and participation in collaborative opportunities. Though the example was developed prior to the group's restructuring of the roundtable's focus on tiered activities, it offered guidance for the subsequent breakout groups as it contained monitoring and assessment elements pertaining to all three tiers.

Attachment 3 details the three-step process used to craft the illustrative 5-year vision. This process included an identification of "proposed outcomes" related to the national picture, monitoring an assessment activities needed to achieve the proposed outcomes, and temporal and

spatial scales for monitoring and information synthesis. In the end, a 5-year vision was proposed:

By 2006, NOS will support the development of a bi-annual, inter-agency report on the status and trends of nutrient-related water quality conditions in estuaries and near coastal waters by:

- *collaboration with Federal and state agencies to synthesize and assess existing water quality and eutrophication symptoms data,*
- *developing an in-situ monitoring network for nutrients and eutrophication symptoms for representative estuaries and marine protected areas,*
- *developing remote sensing techniques for temperature and chlorophyll for near coastal areas and marine protected areas.*

This vision was then evaluated against the existing landscape of other Federal and state programs to determine if NOS' proposed activities were already being conducted. Although several ongoing programs were identified, they were determined to be insufficient to describe a "national picture" of eutrophication conditions. Thus, as a final step for this example, alternative approaches (e.g., partnerships, budget initiatives, reallocation of existing monitoring programs, etc) were proposed that would potentially enable NOS to help fill the gaps and contribute to the national picture.

Given the desired set of outcomes, the means by which they can be successfully accomplished, and the unique capabilities within NOS and NOAA for carrying them out, a vision statement can be formed that describes, for the National Picture, what will be accomplished and for what user groups within a 5 year period. This should then be considered within the context of the landscape of existing monitoring activities within NOAA and also by other agencies such that gaps or opportunities for NOS become clear. The activities for a 5 year strategy, and the best ways in which to accomplish them (i.e. partnering with other agencies where work is presently underway or planned, filling in a gap, etc), can then be prioritized and developed into a comprehensive monitoring plan.

Breakout Group Results: Vision Statements/Outcomes for Tiers I, II, III

Roundtable participants were split into three breakout groups, one for each "tier." Participants were instructed to develop, using Paul Orlando's example as a guide, vision statements about what an NOS monitoring program should look like in 5 years with respect to the specific tier. The vision statements were to be compared to what is presently being done at NOAA and by other agencies and gaps and overlaps identified. Using the overlaps / gaps as a guide, along with the NOS mission and unique capabilities, participants were asked to prioritize the vision statements most in need of effort or investment.

The breakout groups reported out the following vision statements and outcomes / activities for the 5 year vision of nutrient monitoring within NOS:

Tier I

Vision: By the year 2006, NOS will know and describe the status and trends of nutrient enrichment related conditions in estuaries and near coastal waters, and will know where management actions have been implemented and are achieving some result (i.e. reduction in nutrients).

Outcomes / Activities:

1. Conduct a follow up Eutrophication Assessment to fill in gaps and update conditions. This could be done in a number of ways: Partner with interagency CWAP Research and Monitoring Strategy, get money for NOS from interagency budget initiative, go it alone (NOAA)

2. Use a modified method of the Eutrophication Assessment as Performance Measure including enhancements such as remote sensing as a DC-Based Analysis Activity and through more intensive data collection and assessment activities. The opportunities for more intensive data collection could be designed around existing NOS programs such as NMS, NERRS and PORTS and should be balanced against where the gaps are.

Tier II

Vision: Understand the causes and effects of nutrients to better manage / protect coastal areas, especially MPAs

Activities / Outcomes:

- Continue and expand nutrient sensors in SWMP / NERRs and NMS
- Collect data as input for model development and validation
- Optimize existing monitoring platforms within NOS and integrate data streams from other state and federal agencies.
- Establish classification system to help managers and policy makers allocate funding
- Understand susceptibility of coastal water bodies and how this effects development of nutrient related problems
- Predict outcome of management actions
- Collect appropriate data for performance monitoring of management activities to answer questions:
    -- Are management activities improving environment quality?
    -- Are state partners implementing approved programs?
    -- Are we improving our ability to assess the effects of management actions on environment quality?

Tier III

Vision: NOS will develop tools and technology, conduct research and establish partnerships to understand processes, and identify key issues to more effectively manage, monitor, and predict eutrophication impacts in coastal waters.

Activities / Outcomes:

1. Develop standards for monitoring eutrophication impacts and nutrient inputs (medium priority).
2. Conduct process research as feedback to guide management, monitoring, and prediction strategies (medium).
3. Develop state of the art technologies to address Tier I and II activities (medium priority).
4. Develop data and information integration tools (low priority).
5. Develop techniques to better translate science into management (medium priority).
6. Develop partnerships to maximize resources and reduce duplication (high priority?).

Concluding Plenary: Priorities for an NOS Monitoring Program

The plenary then reconvened to give breakout group reports and priorities were identified across all the vision / outcome statements developed for the three tiers.

The following were identified as priorities:

- Conduct a National Estuarine Eutrophication Assessment follow up;
- Use the National Estuarine Eutrophication Assessment as a performance measure but modify the design to include remote sensing and more intensive data collection;
- Optimize existing monitoring platforms within NOS and integrate data from other state and Federal agencies;
- Develop standards for monitoring eutrophication among agencies so that data is consistent and can be compared and used collectively.
- Next Steps and Schedule

A draft synthesis report will be developed, combining the results from Roundtables I and II and presenting the options for a more integrated NOS Environmental Monitoring Program. The CEMC will meet later this summer to review this report and agree upon a set of recommendations to be forwarded to the SMC for their review this fall.

Attachment 1

Attendees
CEMC Monitoring Effectiveness Roundtable II
June 22, 2000

Frank Aikman, CSDL
Suzanne Bricker, SPO
Mary Culver, CSC
Stephen Gill, OR&R/CO-OPS
Kurt Hess, CS/CSDL
Ruth Kelty, NCCOS
Laurie McGilvray, OCRM/ERD
Tom O'Connor, NCOOS/CCMA
Kenrick Osgood, NCCOS/CSCOR
Nancy Ragland Perkins, NCCOS
Andy Robertson, NCCOS/CCMA
Don Scavia, NCCOS
Becky Smyth, NOS M&B
Susan Vidal, NGS/RSD
Kimberly Benson, Marine Sanctuaries
Maurice Crawford, NCCOS
Dan Farrow, SPO
Alison Hammer, SPO
Mark Jacobsen, SPO
Gunnar Lauenstein, NCCOS/ERD
Amy Merten, OR&R
Paul Orlando, SPO
Geno Olmi, CSC
Don Pryor, Science
Peyton Robertson, SPO
Kevin Sellner, NCCOS/CSCOR
Dwight Trueblood, OCRM/NERRS
Marty Welch, CO-OPS

Breakout Groups

Group I: National Picture
Discussion Leader: Peyton Robertson
Kurt Hess
Gunnar Lauenstein
Tom O'Connor
Don Pryor
Andy Robertson
Paul Orlando

Group II: Site Specific
Discussion Leader: Laurie McGilvray
Kimberly Benson
Dan Farrow
Stephen Gill
Alison Hammer
Ruth Kelty
Nancy Ragland Perkins
Geno Olmi

Group III: Technology
Discussion Leader: Maurice Crawford
Frank Aikman
Suzanne Bricker
Mary Culver
Amy Merten
Kenrick Osgood
Dwight Trueblood
Susan Vidal
Marty Welch

Attachment 2

NOS ROLES AND RESPONSIBILITIES
that drive nutrient monitoring activities

- **National Picture** – Provide information characterizing the status and trends of the condition of the nation's estuarine and coastal waters with respect to nutrient enrichment impacts.

- **Development and Application of State-of-the-Art Technologies** - Oversee the adoption of automated, remote detection methodologies for routine incorporation in local-regional monitoring programs, and adoption of comparable detection limits for major nutrient species across local-national programs.

- **Forecasting** – Provide predictions / forecasts of nutrient related problems and information to resource managers to develop suitable solutions.

- **Marine Protected Areas** - Provide information for protection and restoration of areas where NOS has direct management responsibilities.

- **Performance Measurement** – Provide information for measurement and tracking of progress toward meeting NOS strategic planning objectives.

- **Process Research** – Provide information to increase understanding of nutrient interactions including inputs, internal processing, and impacts.

- **Special Ecosystem Studies** – Provide information about specific problems such as HABs, *Pfiesteria* outbreaks, hypoxia, losses of SAVS and other habitat, etc.

Attachment 3

Example: National Picture

PROPOSED OUTCOMES	FUNCTIONS / ACTIVITIES	SCALES	5-YEAR VISION	EXISTING LANDSCAPE	HOW ACCOMPLISHED
1. To quantify the extent of nutrient enrichment conditions in estuaries and near coastal waters	• Data synthesis and assessment	• All estuaries • Sanctuaries (offshore) • Seasonal • Estuary sub-areas	By 2006, NOS will know and describe the status and trends of nutrient-related WQ conditions in estuaries and near coastal waters by: 1. Collaboration with Fed / state agencies to synthesize and assess existing WQ and eutro. symptoms data. 2. Developing an in-situr WQ monitoring network for nutrients and eutro. symptoms for representative estuaries and MPAs. 3. Developing remote sensing techniques for temp and Chl a for near coastal areas and MPAs. *Need to add statement(s) that ensure speccific outcomes for specific purposes and/or users*	• States • Coastal 2000	• Partnerships / Inter-agency collaboration
2. To establish an in-situ monitoring network in estuaries for nutrient enrichment and eutro. symptoms	• In-situ sampling program • Automated data buoys	• Representative estuaries at multiple sites - WQ - Eutro. symptoms - Seasonal • NERRS / Sanctuaries at multiple sites - WQ - Eutro. symptoms - Seasonal / Events • Estuaries with insufficient data and baseline characteristics - WQ • NWLON Ancillary data for representative estuaries - WQ		• States • Coastal 2000	• "Low-hanging fruit" • Re-allocate existing monitoring resources • FY03 Budget Initiative • Partnership / Collaboration
3. To establish remote sensing techniques for quantifying physical indicators of eutro. symptoms	• Satellite remote sensing	• Offshore / Near coastal • Sanctuary focus • Frequency? / Events		• NESDIS • OAR	• Partnership / Collaboration • FY03 Budget Initiative